

IN THE CLAIMS:

The text of all pending claims, (including withdrawn claims) is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with underlining and deleted text with ~~strikethrough~~. The status of each claim is indicated with one of (original), (currently amended), (cancelled), (withdrawn), (new), (previously presented), or (not entered). Please AMEND claims 4, 6, 8, 10-12, 14, 21 and 28-34 and ADD new claim 40 in accordance with the following:

1. (original) A curve production system, comprising:

a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape, and producing relative tape positions relative to a reference position sensing element of the tape; and

a curve generation system producing a smooth tape curve using the relative positions as positions of the tape curve.

2. (original) A system as recited in claim 1, wherein tape shape is dynamically adjustable and curve shape corresponds to the tape shape.

3. (original) A system as recited in claim 2, wherein the curve is part of a surface and a shape of the surface corresponds to the curve shape.

4. (currently amended) A ~~system as recited in claim 1,~~ curve production system, comprising:

a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape, and producing relative tape positions relative to a reference position sensing element of the tape; and

a curve generation system producing a smooth tape curve using the relative positions as positions of the tape curve, and

wherein a scene includes an anchor curve and the tape curve drags out a surface shape from the anchor curve responsive to movement of the flexible tape.

5. (original) A system as recited in claim 4, wherein the surface is created by interpolation between the anchor curve and the tape curve.

6. (currently amended) ~~A system as recited in claim 1, curve production system,~~
comprising:

a flexible handheld tape device comprising a flexible tape having relative position
sensing elements spaced along the tape, and producing relative tape positions relative to a
reference position sensing element of the tape; and

a curve generation system producing a smooth tape curve using the relative positions as
positions of the tape curve, and

wherein the tape curve sets an object profile curve.

7. (original) A system as recited in claim 6, wherein the tape curve provides a path to
drag out an object shape along the profile curve.

8. (currently amended) ~~A system as recited in claim 1, curve production system,~~
comprising:

a flexible handheld tape device comprising a flexible tape having relative position
sensing elements spaced along the tape, and producing relative tape positions relative to a
reference position sensing element of the tape; and

a curve generation system producing a smooth tape curve using the relative positions as
positions of the tape curve, and

wherein the tape curve sets a path curve.

9. (original) A system as recited in claim 8, wherein the tape curve specifies a surface
shape along the path curve.

10. (currently amended) ~~A system as recited in claim 1, curve production system,~~
comprising:

a flexible handheld tape device comprising a flexible tape having relative position
sensing elements spaced along the tape, and producing relative tape positions relative to a
reference position sensing element of the tape; and

a curve generation system producing a smooth tape curve using the relative positions as
positions of the tape curve, and

wherein the flexible curve provides a profile and an object is created by revolving the
profile curve in a scene.

11. (currently amended) ~~A system as recited in claim 1, curve production system,~~
comprising:

a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape, and producing relative tape positions relative to a reference position sensing element of the tape; and

a curve generation system producing a smooth tape curve using the relative positions as positions of the tape curve, and

wherein the tape curve is a spline curve and the relative tape positions are used as control points of the tape curve.

12. (currently amended) ~~A system as recited in claim 1, curve production system,~~
comprising:

a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape, and producing relative tape positions relative to a reference position sensing element of the tape;

a curve generation system producing a smooth tape curve using the relative positions as positions of the tape curve; and further comprising

a world position sensor attached to the flexible tape and providing a three dimensional world position of the tape and said curve generation system positions the tape curve in a virtual scene in correspondence to the world position.

13. (original) A system as recited in claim 12, wherein said world position sensor senses three dimensional world orientation of said world sensor and said curve generation system positions the tape curve in a virtual scene in correspondence to the world orientation.

14. (currently amended) ~~A system as recited in claim 1, curve production system,~~
comprising:

a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape, and producing relative tape positions relative to a reference position sensing element of the tape;

a curve generation system producing a smooth tape curve using the relative positions as positions of the tape curve; and further comprising

a command input device producing an input command and said curve generation system controls the tape curve responsive to the input command.

○ 15. (original) A system as recited in claim 14, wherein said command input device comprises one of a foot pedal, a foot mouse, buttons on a position locator and a portion of the flexible tape.

16. (original - allowed) A system, comprising:
a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape and producing relative tape positions to a reference position sensing element of the tape; and
an animation system using the relative positions as a command.

A1
cont
17. (original - allowed) A system as recited in claim 16, wherein a shape of the input device flexible tape indicates a command.

18. (original - allowed) A system as recited in claim 16, wherein an end portion of the flexible tape is used for input command gestures.

19. (original - allowed) A system as recited in claim 16, wherein an end portion of the flexible tape is used for a cursor control command.

20. (original - allowed) A system as recited in claim 16, wherein an end portion of the flexible tape is used for a selection control command.

21. A system as recited in claim-1416, wherein a system user drops curves in a scene responsive to tape curve position and the input command.

22. (original - allowed) A system, comprising
a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape and producing relative tape positions relative to a reference position sensing element of the tape; and
editing system editing one of curves and surfaces responsive to the relative position.

23. (original - allowed) A system as recited in claim 22, wherein a virtual scene includes a scene curve and said curve generation system edits the scene curve responsive to the tape curve.

24. (original - allowed) A system as recited in claim 22, wherein a scene includes a wire curve and the tape curve controls the wire curve.

25. (original - allowed) A system as recited in claim 24, wherein the flexible tape comprises twist sensors and the wire curve is twisted in correspondence to the tape curve responsive to twist of the flexible tape.

26. (original - allowed) A system as recited in claim 22, wherein a scene includes a wire curve and a wire reference curve and the tape curve controls the wire curve and the wire reference curve.

27. (original - allowed) A system as recited in claim 22, wherein a scene include a scene curve and the scene curve is snapped to a shape of the tape curve.

28. (currently amended) A ~~system as recited in claim 1,~~ curve production system, comprising:

a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape, and producing relative tape positions relative to a reference position sensing element of the tape; and

a curve generation system producing a smooth tape curve using the relative positions as positions of the tape curve, and

wherein said curve generation system comprises a user controllable gain controlling relative positions of the tape curve responsive the relative positions of the flexible tape.

29. (currently amended) A ~~system as recited in claim 1,~~ curve production system, comprising:

a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape, and producing relative tape positions relative to a

reference position sensing element of the tape; and

a curve generation system producing a smooth tape curve using the relative positions as positions of the tape curve, and

wherein said tape curve is displayed egocentrically to the user in a scene in which the tape curve is interacting within changes in viewpoint.

30. (currently amended) A ~~system as recited in claim 1,~~ curve production system, comprising:

a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape, and producing relative tape positions relative to a reference position sensing element of the tape; and

a curve generation system producing a smooth tape curve using the relative positions as positions of the tape curve, and

wherein the flexible tape comprises a physical constraint comprising one of a substitutable mechanical stiffness member, a physical position lock and a shape retaining member.

31. (currently amended) A ~~system as recited in claim 1,~~ curve production system, comprising:

a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape, and producing relative tape positions relative to a reference position sensing element of the tape; and

a curve generation system producing a smooth tape curve using the relative positions as positions of the tape curve, and

wherein the tape curve dynamically controls curves in a dynamic scene responsive to the flexible tape.

32. (currently amended) A ~~system as recited in claim 1,~~ curve production system, comprising:

a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape, and producing relative tape positions relative to a reference position sensing element of the tape; and

a curve generation system producing a smooth tape curve using the relative positions as

positions of the tape curve, and

wherein the flexible tape is conformed to a shape of a physical object and the tape curve comprises an input of the shape.

33. (currently amended) A ~~system as recited in claim 1,~~ curve production system, comprising:

a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape, and producing relative tape positions relative to a reference position sensing element of the tape; and

a curve generation system producing a smooth tape curve using the relative positions as positions of the tape curve, and

wherein said device includes subsection specification sensors and said tape curve shape is responsive to subsection shape.

AI
cont
34. (currently amended) A ~~system as recited in claim 1,~~ curve production system, comprising:

a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape, and producing relative tape positions relative to a reference position sensing element of the tape;

a curve generation system producing a smooth tape curve using the relative positions as positions of the tape curve; further comprising:

a two-dimensional surface upon which said device rests and upon which surface a shape of said device is changed; and

a world position input device specifying a world position of the tape curve.

35. (original - allowed) A curve production system, comprising:

a flexible handheld tape device comprising a dynamically shape adjustable flexible tape having relative position sensing elements spaced along the tape and producing relative tape positions relative to a reference position sensing element of the tape;

a curve generation and editing system producing a smooth spline tape curve using the relative positions as positions of the tape curve corresponding to the dynamically adjusted shape and producing a shape of a surface when the tape curve drags out a surface shape from an anchor curve responsive to movement of the flexible tape; and

a world position sensor attached to the flexible tape and providing a three dimensional world position and orientation of the tape and said curve generation system positioning the tape curve in a virtual scene in correspondence to the world position and orientation; and

with said tape device acting as command input device producing an input command and said curve generation system controlling and editing the tape curve responsive to the input command and a shape of the tape curve.

36. (original - allowed) A curve production system, comprising:

a flexible tape device producing shape, twist and six degrees of freedom position information; and

display means displaying a virtual curve having a shape, a twist and a position corresponding to the shape, twist and six degrees of freedom position information.

37. (original) A curve production method, comprising:

adjusting a shape of a flexible tape; and

producing a virtual curve using the flexible tape as control points of a non-uniform rational B-spline curve.

38. (original) A computer readable storage controlling a computer and comprising a process of inputting a shape of a flexible tape and controlling a non-uniform rational B-spline curve responsive to the shape.

39. (original) A graphical user interface comprising a virtual non-uniform rational B-spline tape curve manipulable in a scene responsive to a physical flexible tape.

40. (new) A curve production method, comprising:

adjusting a shape of a flexible tape with two hands; and

producing a virtual curve using the flexible tape.